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ONTARIO WATER RESOURCES
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Simcoe
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n Plant (OWRC)

TOWN OF SIMCOE
COUNTY OF NORFOLK

MUNICIPAL WATER POLLUTION
CONTROL PLANT (OWRC)

TD
380
.S56
1968
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TD Town of Simcoe, county of
380 Norfolk : municipal water
.S56 pollution control plant.
1968 80874

REPORT

Ontario Water Resources Commission

Municipality: TOWN OF SIMCOE, COUNTY OF NORFOLK
Date of Inspection: November 27, 1967
January 18, 1968
April 23, 1968
June 20, 1968
Re: MUNICIPAL WATER POLLUTION CONTROL PLANT
Field Inspection by: H. A. McLean, Engineer.
Report by: H. A. McLean.

INTRODUCTION

The water pollution control plant and sludge disposal facilities for the Town of Simcoe were visited on November 27, 1967 and on January 18, April 23 and June 20, 1968. On April 23, a survey was made to determine the status of the water quality of the Lynn River and associated tributaries, and of the discharge from the main storm sewers. Samples were collected during the night of June 20 - 21 to evaluate the variations in waste strength of raw sewage and final effluent at the water pollution control plant.

During these visits to the municipality the following officials were interviewed:

Mr. E. Percival, Chief Operator,
Mr. I. B. Sveinbjornson, P.U.C. Manager,
Mr. J. Forster, Manager of Board of Works,
Mr. D. H. Gilbertson, Clerk-Treasurer.

These officials represent the various organizations participating in pollution abatement for the Town of Simcoe. The Board of Works constructs the storm and sanitary sewers and maintains the storm sewers while the Public Utilities Commission maintains the sanitary sewers and pumping stations and disposes of the sludge from the treatment plant. The treatment plant is operated by Mr. E. Percival and his staff under the direction of the Division of Plant Operations. Liason between the municipality and the OWRC is through the Local Advisory Committee composed of officials of the Town of Simcoe, the Public Utilities Commission and the Division of Plant operations.

This report reviews the operation of the treatment facilities during 1967 and at the time of the inspections. Information is outlined concerning the status of pollution abatement in the Town of Simcoe and a general recommendation is presented concerning the provision of adequate facilities to meet the anticipated growth of this municipality.

DESCRIPTION OF WORKS

The water pollution control plant with a total design capacity of 2.0 mgd is composed of two plants with separate primary sedimentation, aeration and final sedimentation facilities. Sludge is treated in a two stage digester and disposed of in sludge holding lagoons. The final effluent is discharged into the Lynn River downstream of the Town of Simcoe.

A complete description of the physical aspects of these facilities is appended to a previous Commission report dated January 14, 1964.

WASTE FLOW

During 1967, a total waste flow of 621.104 million gallons was treated; this is an average daily flow of 1.702 mgd or 85 per cent of the plant's design capacity. The maximum day was 2.566 million gallons or 128 per cent of design capacity while the minimum daily flow was 1.157 million gallons. Monthly flow data is presented in Table I.

It is noted that Plant # 1 was under repair for three months in 1967. During this period all flow was directed through Plant # 2 resulting in the flow being considerably in excess of the design capacity. The average flow in September was 1.907 mgd or 136 per cent of the design capacity of Plant # 2 (1.4 mgd).

The total waste flow in 1966 was 626.129 million gallons indicating a decrease in flow in 1967 of 0.8 per cent. Although a decrease in flow is indicated, this does not represent the trend of growth of the Town of Simcoe. The recent confirmation by the Steel Company of Canada to extensively develop in the Nanticoke area will probably result in considerable growth of the Town. Planning authorities are anticipating a growth in population from 10,000 to 21,000 people in the next 12 years. Such growth will necessitate an expansion of the waste treatment facilities. At present the plant is operating at an average capacity of 85 per cent of design. During the peak canning season of September, October and November an additional waste flow of 150,000 gpd would bring the volume to design capacity.

These observations and trends suggest that steps should be taken to determine what expansion will be necessary. Such foresight now should ensure that residential and industrial development will not need to be curtailed in the future due to inadequate waste treatment facilities.

OPERATION OF WORKS

Raw Sewage Pump Well

Sewage from the Town flows by gravity to the plant and then is pumped from the raw sewage well. The raw sewage pumps are operated by float controls with the sequence of pumps permitting the following pumpages as the flow to the plant increases: 500, 1500, 3500 and 5500 U.S. gpm. At certain flows the next pump in sequence may only operate for short periods chausing surges in flow. No controls are available to automatically vary the capacity of one of the pumps in proportion to the flow in order to eliminate the surges.

An examination of the plant flow charts revealed the extent that this pumping arrangement was responsible for fluctuations in flow. On April 22, the 2000 U.S. gpm pump was activated 26 times between 8:00 a.m. and 8:00 p.m.; each pumping duration was approximately 3 minutes. When the 2000 U.S.gpm pump was activated, the flow being treated was more than doubled. Such surging disrupts the gravity sedimentation process in both the primary and final settling tanks. A more refined method for controlling the flows through the plant should be considered in any studies for plant expension.

In the event of a power failure, no auxiliary units are available to drive the pumps. If the power is off for a extended period of time, the raw sewage can back-up and overflow at a manhole on the trunk sewer near the Lynn River. A visual observation indicated that the overflow arrangement may not have sufficient capacity to carry all the waste. Therefore, the resulting effect could be further waste backup and/or lifting of the manhole covers. Since sedimentation and chlorination should be the minimum treatment for any waste, it is suggested that the raw sewage by-pass arrangement be given further consideration.

Detritor

Plant records indicate that a total of 431 cubic feet of grit was removed during 1967 (Table II). This is an average of 0.7 cubic feet per million gallons of flow. The grit is buried on the property adjacent to the treatment plant.

Primary Sedimentation Tanks

The primary sedimentation tanks appeared to be operating satisfactorily at the time of the inspections. The operator indicated that this unit is especially overloaded during the canning season resulting in heavy organic load to the aeration tanks. When solids and waste activated sludge do not settle in the primary tanks, cycling of solids through all the treatment units occurs. In Plant # 2 the suspended solids reduction in the primary tank is generally low and on occasion the suspended solids content of the primary effluent is greater than that of the raw sewage. It is also noted that until early 1968 all waste sludge from # 1 plant was returned to the # 2 plant primary clarifier which could account in part for the problems experienced.

It is noted that supernatant is seldom returned to the primary tanks; this results in the sludge disposal facilities having a heavy hydraulic load. Supernatant is not returned since this would impose a greater hydraulic load on the primary tanks. Also a clear supernatant is seldom obtained. Therefore, overloaded primary tanks affect both aeration and digester facilities.

Table II contains the monthly pumpage data of liquid pumped to the digester. Approximately 0.6 per cent of the raw sewage flow is pumped to the digester; this is an average of 9600 gpd. The pumpage increases considerably during the canning season (August to November). Normally raw sludge is pumped to the digester 8 times per day.

AERATION TANKS

A perusal of results of routine tests performed at the plant indicates that a good settling sludge is maintained in the aeration tanks. The air blowers are capable of maintaining an adequate dissolved oxygen concentration in the aeration tank contents. The tabulated data of air supplied (Table II) reveals that more air is necessary during the warmer weather and during the period of the heavy organic load from the cannery.

Final Sedimentation Tanks

The final sedimentation tanks appeared to be operating satisfactorily at the time of the inspections. The final effluent usually has a clear, sparkling appearance.

Samples of return sludge collected on November 27, 1967 suggest that this unit was effective at that time in concentrating the aeration tank suspended solids by approximately 200 and 400 per cent for the old and new plant respectively.

Chlorination

Chlorination is usually practiced from April 15 to October 15. In 1967, 13,196 pounds of chlorine were used, for an average chlorine dosage of 4.3 ppm. Due to the clear effluent being achieved at this treatment plant such a chlorine dosage is sufficient to provide the required chlorine residual of at least 0.5 ppm.

Digestion

As discussed under Primary Sedimentation tanks, approximately 9600 gpd are pumped to the first stage digester. Liquid is transferred from the first to the second digester each morning. The first stage digester is maintained at approximately 95° F.

The amount of liquid pumped from the digester to the sludge holding lagoons is estimated by the distance the digester cover is lowered. This estimate appears to be very much in error since supernatant is seldom returned and therefore the volume of sludge pumped to the digester is also the volume pumped to the sludge holding lagoon. However, Table II would suggest that only 43 per cent of the sludge is pumped to the holding lagoon. Previous reports should be changed to indicate that both quantities are basically the same with the quantities to the digester being more accurate.

The digesters have a capacity of 86,500 cubic feet or 540,000 gallons. Using this volume, an average detention time of 56 days is indicated for the sludge in the digester. When the sludge is pumped to the holding lagoons, the organic matter appears to be sufficiently digested that odours are not a problem.

It is reported that considerable gas is given off from the digester, thus suggesting satisfactory operation. However, the lack of a supernatant results in large quantities of sludge being pumped to the holding lagoons and therefore there are sludge handling problems. At present, the detention time in the digester is sufficient to reduce the organic content to a satisfactory level that odours are not encountered. With future increases in flow a sufficient detention time may not be available. It is suggested that the operation of this unit receive close supervision in order to determine the best method of operation.

Sludge Holding Lagoons

Although sludge drying beds were originally available for sludge disposal, the beds must be considered as holding lagoons since the underdrains are plugged. Three other ponds are also used for holding sludge. Since there are no operating underdrains, all liquid must be removed by evaporation.

To simplify the administration of waste treatment for the Town of Simcoe, the operation of the waste treatment facilities and the disposal of sludge from the digester should be the responsibility of one authority. If this recommendation is adopted, studies on the best method of disposal will be undertaken.

RESULTS OF SANITARY CHEMICAL ANALYSES

Tables III and IV contain results of samples analysed each month at the OWRC Laboratory. All samples are composites. The yearly averages are based on approximately 20 samples.

For Plant # 1, the primary sedimentation tank provided a 31 per cent removal of suspended solids with an overall plant removal efficiency of 96 and 95 per cent with respect to BOD and suspended solids. In some cases the suspended solids from Plant # 2 primary tank were greater than the suspended solids in the raw sewage. However, the overall efficiency for Plant # 2 was 97 and 93 per cent with respect to BOD and suspended solids for 1967. These efficiencies are similar to those obtained in 1966. The operation of the treatment facilities to obtain final effluent BOD and suspended solids concentrations of 10 ppm is considered excellent.

Results of samples collected during the inspections are appended. The results indicate a high quality effluent as noted above.

INDUSTRIAL WASTES

Table IV contains a summary of monthly industrial water consumption for the larger water users in the Town of

Simcoe. This information was obtained from the Public Utilities Commission. It is noted that all industries are charged 100 per cent of their water bill (from the P.U.C.) for the sewer service.

The largest water user is Canadian Canners Company Limited. In 1967, the average water consumption from both their own well and the P.U.C.'s was approximately 200,000 gpd. Wastes from this company are screened prior to discharge to the sanitary sewer. Although a survey of this industry's operation has not been conducted, there is a general impression that the waste has a high organic strength. It is suggested that composite samples be submitted on a routine basis from this industry to permit assessment of the waste load.

The J. B. Jackson Company Limited is involved in the making of ice cream and other milk products. The water from their own well is used for cooling purposes while water supplied by the Public Utilities Commission is for the processing of the various products. It is indicated that the cooling water is discharged to a storm sewer.

Many of the other industries listed on Table V use most of their water for cooling purposes and thus the liquid is not contaminated. However, Town officials have indicated that this water is discharged to sanitary sewers rather than to storm sewers. Such practice imposes an unnecessary hydraulic load on the waste treatment plant. The present system of charging industries for the sewer service (100 per cent of the water bill) does not lend itself to encouraging the industries to discharge all non-contaminated water to the storm sewer. It is suggested that the Town of Simcoe investigate how much unnecessary flow is received at the treatment plant and subsequently revise their billing procedure to make it advantageous for industry to separate their waste flow. This would benefit both the Town and industry.

The control of discharge of sewage into the sewage system is best administered through a "sewer-use" by-law approved by the municipality. Arrangements have been made for the OWRC Division of Industrial Wastes to send the necessary information to the municipality outlining a model by-law and a draft agreement between the municipality and industry.

STREAM SURVEY

On April 23, samples were collected for chemical and bacteriological examination from the Lynn River and the various tributaries and storm drain outfalls. The water quality was generally very good with respect to BOD and suspended solids. The coliform count of bacteria increased as the river progressed through the municipality with the count at Norfolk St. being 144 while at Decou Road the count was 13,000. A count of 2400 is the desired upper limit for water courses. The counts from all storm outfalls were in excess of the desired limit. Samples from Argyle St. and Union St. storm sewers are noted in particular; results of samples collected at these locations are appended. Since Argyle St. services the business district, there are possibly old connections to the storm sewer which discharge a contaminated waste. Laboratory analyses results (Table VIII, appended) indicate that the liquid carried by this storm sewer fluctuates in quality.

A periodic discharge of waste has been noted at the Union Street storm sewer. This waste has been milky white and sometimes red. The various authorities in the Town of Simcoe are knowledgable of the fact that a waste is being discharged to this storm sewer. Since the area is serviced by sanitary sewers, the source of the waste should be located and the necessary alterations made to direct the waste to the sanitary sewer.

It is noted that the municipality is completely serviced by sanitary sewers except for a few small isolated areas.

VARIATIONS IN WASTE LOAD

From 5:30 PM June 20 to 8:00 AM June 21, 1968, samples were collected of the raw sewage and final effluent at the water pollution control plant. Each sample was a three-hour composite from 6 grab samples collected every half-hour. Flows were also recorded every half-hour. The results of the flow data and analyses results are tabulated on Tables VIa and VIb respectively.

It is noted that the flow decreased by 40 per cent during the period sampled. This low flow was reached approximately by mid-night with the wet well equalizing any abrupt changes in flow. The raw sewage strength decreased by 76.6 and 75.7 per cent with respect to BOD and suspended solids with the lowest strength being present in the sample collected from 5:30 AM to 8:00 AM. The sewage strength is similarly equalized by the presence of the wet well. Analyses results of the final effluent samples indicate minor fluctuation in effluent quality with the variations in sewage flow and strength.

The flows to the waste treatment plant have been considerably in excess of the water pumpage in the Town of Simcoe (Canadian Canner's well included). In 1967, the sewage flow was 145 per cent of the water pumpage (192.498 million gallons in excess); this would suggest considerable infiltration; however, cooling water would also cause dilution. Although infiltration appears to be considerable, the cost of eliminating it may possibly be greater than expanding the treatment facilities to cope with this flow.

SUMMARY

The water pollution control facilities for the Town of Simcoe were visited on November 27, 1967 and on January 18, April 23 and June 20, 1968. The operation of the treatment facilities was satisfactory on the above dates.

The average daily flow in 1967 was 85 per cent of the plant's design capacity. At certain times of the year, the flow is sufficiently great to impair the efficiency of the primary sedimentation tanks; however, the overall treatment efficiency of these works is satisfactory. Due to anticipated growth for this area and the present flows being received at this plant, planning should be started now for expansion of these facilities.

Information is presented concerning various aspects of these treatment facilities which could be improved when the plant is expanded. In particular the operation of the raw sewage pumps, auxillary power and by-pass facilities, and sludge disposal facilities are discussed.

A survey was made of the water quality of the Lynn River and its tributaries, and the major storm sewers on April 23, 1968. The overall quality of the watercourses is generally satisfactory with the coliform count increasing as the river passes through the town. All storm sewers contained excessive coliform counts with two storm sewers (Union Street and Argyle Street) containing wastes that should be directed to the sanitary sewer rather then the storm sewer.

A sampling and flow checking programme was carried out during the evening, night and morning of June 20/21, 1968. Observations indicated that the flows at the treatment plant decreased by 40 per cent during the evening. The BOD and suspended solids decreased by 76.7 and 75.7 per cent with respect to BOD and suspended solids with lowest values obtained during tha morning hours. The final effluent quality remained essentially constant.

Since the sewage flow coming into the plant is approximately 145 per cent of the water pumpage, it is reasonable to assume that the sewer system is subject to considerable infiltration. However, since an unknown volume of industrial cooling water is being discharged to the sanitary sewers, the amount of infiltration has not been determined. The cost of eliminating infiltration would likely be excessive.

Various industries appear to be discharging strong wastes while others discharge mainly cooling water. The Division of Industrial Wastes is sending information to the Town of Simcoe concerning a sewer-use by-law and other typical agreements between municipalities and industry. Such a by-law is essential for controlling the wastes discharged to a sewage system.

RECOMMENDATIONS

1. The Town of Simcoe should investigate and eliminate the discharge of wastes into the Union Street and Argyle Street storm sewers.

2. The Town of Simcoe should obtain a satisfactory sewer-use by-law; this should be in agreement with our Division of Industrial Wastes.

3. Planning should start now for the expansion of the waste treatment facilities. Improvements to the present facilities, as outlined in this report, should be incorporated into these plans.

HAM:dp Prepared by: Wayne Scott

for H. A. McLean,
Engineer,
Division of Sanitary Engineering.

TABLE I

TOWN OF SIMCOE

MUNICIPAL WATER POLLUTION CONTROL PLANT

WASTE FLOW

1967

Month	# 1 Plant (old)				# 2 Plant (new)				Combined			
		Daily Flow MGD				Daily Flow MGD				Daily Flow MGD		
	Total (MG)	Avg.	Max.	Min.	Total (MG)	Avg.	Max.	Min.	Total (MG)	Avg.	Max.	Min.
JANUARY	11.963	.386	.470	.244	31.363	1.011	1.322	.844	43.326	1.398	1.571	1.157
FEBRUARY	11.030	.394	.569	.298	26.708	.954	1.144	.810	37.738	1.347	1.607	1.201
MARCH	10.292	.332	.490	.100	35.464	1.144	1.475	.854	45.756	1.476	1.762	1.159
APRIL	18.037	.601	.697	.469	41.299	1.377	1.731	1.006	59.336	1.978	2.330	1.539
MAY	17.377	.561	.717	.306	40.030	1.291	1.866	.628	57.407	1.852	2.566	1.254
JUNE	13.864	.462	.621	.202	37.180	1.239	1.542	1.012	51.044	1.701	2.163	1.500
JULY	*10.198	.464	.541	.276	42.575	1.373	1.863	1.030	52.773	1.702	1.974	1.524
AUGUST	* -	-	-	-	50.490	1.629	1.897	1.395	50.490	1.629	1.897	1.395
SEPTEMBER	* -	-	-	-	57.206	1.907	2.260	1.329	57.206	1.907	2.260	1.329
OCTOBER	* -	-	-	-	56.615	1.826	2.185	1.503	56.615	1.826	2.185	1.503
NOVEMBER	10.948	.378	.516	.257	44.466	1.482	1.836	1.148	55.414	1.847	2.053	1.521
DECEMBER	14.917	.481	.777	.281	39.082	1.261	1.552	1.000	53.999	1.741	2.329	1.511
TOTAL	118.626				502.478				621.104			
AVERAGE		.435				1.377				1.702		
MAXIMUM			.777				2.260				2.566	
MINIMUM				.100				.628				1.157

NOTE - * # 1 primary sedimentation tank not operating
Records obtained from the Division of Plant Operations.

TABLE II

TOWN OF SIMCOE

MUNICIPAL WATER POLLUTION CONTROL PLANT

OPERATIONAL DATA

1967

Month	Combined Flow (MG)	Grit Removed Cu.Ft.	Sludge Pumped		Chlorine Consumption (lbs)	Air Supplied	
			To Digester (gallons)	From Digester (gallons)		#1 Plant (million Cu.Ft./day)	#2 Plant
JANUARY	43.326	40	264,580	174,000	-	1.728	7.200
FEBRUARY	37.738	32	246,740	137,000	-	1.728	7.200
MARCH	45.756	43	262,240	181,000	-	1.728	7.200
APRIL	59.336	30	246,728	85,000	298	2,592	11.199
MAY	57.407	37	254,560	65,000	1278	2,371	8,952
JUNE	51.044	33	268,700	129,000	2208	2.100	9,689
JULY	52.773	17	273,960	42,000	1808	1.728	7.200
AUGUST	50.490	2	306,504	138,000	2206	-	14.228
SEPTEMBER	57.206	52	342,560	80,000	1636	-	14.400
OCTOBER	56.615	47	355,920	165,000	2129	-	14.400
NOVEMBER	55.414	49	386,640	174,000	1633	1.725	9.874
DECEMBER	53.999	49	284,560	148,000	-	1.807	9.058
TOTAL	621.104	431	3,493,692	1,518,000	13,196		
AVERAGE	1.702	0.7 *	0.56 **		3.7 ***		

* Cubic feet of grit per million gallons of flow

** Sludge volume as percentage of raw sewage flow

*** Average chlorine dosage in ppm.

TABLE III

TOWN OF SIMCOE

MUNICIPAL WATER POLLUTION CONTROL PLANT

SANITARY CHEMICAL ANALYSES - PLANT # 1

1967

MONTH	RAW SEWAGE						PRIMARY EFFLUENT						AERATION TANK	FINAL EFFLUENT					
	B O D			SUSPENDED SOLIDS			B O D			SUSPENDED SOLIDS			SUSPENDED SOLIDS	B O D			SUSPENDED SOLIDS		
	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.		AVG.	MAX.	MIN.	AVG.	MAX.	MIN.
JANUARY	164	170	158	154	167	141	124	127	122	78	82	75	2314	17	26	8	14	21	7
FEBRUARY	279	283	275	205	210	200	112	135	88	106	124	92	3011	18	19	17	15	16	14
MARCH	366	308	365	205	210	200	225	263	166	110	112	108	2562	10	12	8	5	9	3
APRIL	267	310	225	169	174	164	200	240	161	120	124	116	2758	9	10	9	8	8	7
MAY	222	260	160	178	192	156	173	212	125	96	108	62	2736	4	4	3	8	12	6
JUNE	267	267	267	222	222	222	149	160	138	151	196	106	3265	6	10	2	3	3	3
JULY	76	76	76	80	80	80	99	99	99	104	104	104	2846	4	4	4	10	10	10
AUGUST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SEPTEMBER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OCTOBER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NOVEMBER	255	410	100	205	328	82	328	355	300	249	362	136	2735	8	11	5	11	12	10
DECEMBER	225	270	180	253	332	174	175	200	150	116	118	114	3325	9	10	8	14	20	9
AVERAGE	243			189			187			130			2650	9.5			9.6		
MAXIMUM		410			332			355			362		3325		26			20	
MINIMUM			100			80			88			75	2314			2			3

TABLE IV

TOWN OF SIMCOE

MUNICIPAL WATER POLLUTION CONTROL PLANT

SANITARY CHEMICAL ANALYSES - PLANT # 2

1967

MONTH	RAW SEWAGE						PRIMARY EFFLUENT						AERATION TANK	FINAL EFFLUENT					
	B O D			SUSPENDED SOLIDS			B O D			SUSPENDED SOLIDS			SUSPENDED SOLIDS	B O D			SUSPENDED SOLIDS		
	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.	AVG.	MAX.	MIN.		AVG.	MAX.	MIN.	AVG.	MAX.	MIN.
JANUARY	276	310	220	208	252	160	243	265	215	285	344	223	2765	13	15	9	9	10	8
FEBRUARY	253	253	253	272	272	272	150	150	150	172	172	172	2048	17	17	17	7	7	7
MARCH	316	360	278	199	256	158	276	340	220	170	190	146	2068	11	18	5	16	29	5
APRIL	285	285	285	144	144	144	129	129	129	158	158	158	2702	25	25	25	24	24	24
MAY	237	255	220	141	144	138	195	240	150	128	136	120	2514	5	6	4	10	10	10
JUNE	299	318	280	181	194	168	290	340	240	269	312	226	2064	4	4	4	9	9	8
JULY	256	363	150	149	161	138	225	225	255	145	145	144	2691	7	9	4	4	4	3
AUGUST	249	305	187	145	206	84	238	245	225	237	456	96	3353	8	12	3	16	20	13
SEPTEMBER	215	215	215	156	156	156	195	195	195	260	260	260	3069	9	9	9	7	7	7
OCTOBER	215	260	170	172	190	154	272	330	215	491	818	164	3570	5	5	5	25	36	13
NOVEMBER	513	1050	205	286	316	260	443	950	170	398	676	164	3350	9	11	7	10	14	4
DECEMBER	260	260	260	158	158	158	250	250	250	86	86	86	3164	4	4	4	4	4	4
AVERAGE	284			181			265			257			2620	9			11.6		
MAXIMUM		1050			316			950			818		3370		25			24	
MINIMUM			150			84			129			96	2064			3			3

TABLE V

TOWN OF SIMCOE

INDUSTRIAL WATER CONSUMPTION

1967

Month	Canadian Canners	Canada Wire and Cable	Simcoe Arena	J. B. Jackson	American Can	St.Williams Preserves	Norfolk Fruit Growers Association
JANUARY	492,800	253,000	228,700	138,900	151,000	172,000	70,700
FEBRUARY	242,600	65,400	153,400	148,600	191,300	169,600	60,600
MARCH	450,800	81,200	121,600	136,200	182,900	163,800	33,700
APRIL	780,900	146,200	117,800	160,700	189,500	148,800	53,800
MAY	807,800	149,400	14,000	172,800	192,000	130,900	55,200
JUNE	438,400	419,800	22,000	165,100	188,700	162,300	70,100
JULY	238,200	201,200	29,800	213,300	211,600	138,500	102,600
AUGUST	195,800	128,400	28,200	230,200	194,700	140,000	71,300
SEPTEMBER	634,300	253,700	111,700	157,400	232,600	72,600	124,500
OCTOBER	1,274,400	194,500	54,500	118,900	222,000	176,400	288,500
NOVEMBER	1,119,500	199,400	298,300	131,100	199,400	152,900	147,000
DECEMBER	943,700	388,400	211,400	122,900	169,500	160,500	90,200
TOTAL (cu.ft)	7,619,200	2,480,600	1,391,400	1,391,400	1,896,100	2,325,200	1,168,200
(gallons)	47,543,808	15,478,944	8,682,336	11,831,664	14,509,248	11,158,992	7,289,568

NOTE: In 1967, Canadian Canners used 27,760,000 gallons from their own well.
J. B. Jackson also has their own well but the volume pumped is not known.

TABLE VIa

TOWN OF SIMCOE

MUNICIPAL WATER POLLUTION CONTROL PLANT

FLOWS DURING SAMPLING PROGRAMME JUNE 20-21, 1968

	Time	Total Flow (gallons)	Plant # 1 (gallons)
June 20	12:00 PM - 5:30 PM	415,000	
	5:30 PM - 6:00 PM	40,000	11,000
	6:00 PM - 6:30 PM	36,000	9,000
	6:30 PM - 7:00 PM	37,000	10,000
	7:00 PM - 7:30 PM	35,000	9,000
	7:30 PM - 8:00 PM	34,000	9,000
	8:00 PM - 8:30 PM	36,000	10,000
	8:30 PM - 9:00 PM	39,000	9,000
	9:00 PM - 9:30 PM	38,000	9,000
	9:30 PM - 10:00 PM	37,000	10,000
	10:00 PM - 10:30 PM	35,000	9,000
	10:30 PM - 11:00 PM	34,000	10,000
	11:00 PM - 11:30 PM	32,000	9,000
	11:30 PM - 12:00 AM	27,000	7,000
	12:00 AM - 12:30 AM	35,000	9,000
	12:30 AM - 1:00 AM	26,000	6,000
	1:00 AM - 1:30 AM	29,000	9,000
	1:30 AM - 2:00 AM	28,000	7,000
	2:00 AM - 2:30 AM	27,000	7,000
	2:30 AM - 3:00 AM	26,000	7,000
	3:00 AM - 3:30 AM	26,000	7,000
	3:30 AM - 4:00 AM	27,000	7,000
	4:00 AM - 4:30 AM	25,000	7,000
	4:30 AM - 5:00 AM	26,000	6,000
	5:00 AM - 5:30 AM	26,000	7,000
	5:30 AM - 6:00 AM	25,000	7,000
	6:00 AM - 6:30 AM	24,000	7,000
	6:30 AM - 7:00 AM	27,000	7,000
	7:00 AM - 7:30 AM	26,000	7,000
	7:30 AM - 8:00 AM	31,000	8,000

TABLE VIB

TOWN OF SIMCOE

MUNICIPAL WATER POLLUTION CONTROL PLANT

COMPOSITE SAMPLING PROGRAMME JUNE 20-21, 1968

RAW SEWAGE

TIME	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	ANIONIC DETERGENTS AS ABS	NITROGEN AS N FREE AMMONIA	NITROGEN AS N TOTAL KJELDAHL	NITROGEN AS N NITRITE	NITROGEN AS N NITRATE	PHOSPHORUS AS PO_4 TOTAL	PHOSPHORUS AS PO_4 SOL.
5:30 PM - 8:00 PM	200	730	144	586 DRIED	3.6	12.0	24.0	.010	0.00	19.	7.5
		460	26	434 ASHED							
		270	118	152 LOSS							
8:30 PM - 11:00 PM	150	576	86	490 DRIED	4.1	16.0	18.8	.005	.005	16.	7.5
		404	13	391 ASHED							
		172	73	99 LOSS							
11:30 PM - 2:00 AM	190	564	89	475 DRIED	2.5	10.0	16.0	.005	.005	12.	6.0
		396	8	388 ASHED							
		168	81	87 LOSS							
2:30 AM - 5:00 AM	155	506	66	440 DRIED	0.5	5.0	9.2	.010	7.8	16.	7.0
		374	4	370 ASHED							
		132	62	70 LOSS							
5:30 AM - 8:00 AM	68	490	35	455 DRIED	0.4	8.5	9.9	.005	.005	14.5	6.0
		386	2	384 ASHED							
		104	33	71 LOSS							

FINAL EFFLUENT

PLANT # 1

TIME	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	ANIONIC DETERGENTS AS ABS	TURBIDITY UNITS
5:30 PM - 8:00 PM	7.0	504	3	501	0.2	3.1
8:30 PM - 11:00 PM	8.6	538	8	530	0.2	3.5
11:30 PM - 2:00 AM	9.2	548	9	539	0.2	4.5
2:30 AM - 5:00 AM	9.0	516	9	507	0.2	8.0
5:30 AM - 8:00 AM	7.6	506	7	499	0.2	8.0

PLANT # 2

TIME	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	ANIONIC DETERGENTS AS ABS	TURBIDITY UNITS
5:30 PM - 8:00 PM	11.6	524	8	516	0.7	16.
8:30 PM - 11:00 PM	4.8	556	12	544	0.8	23.
11:30 PM - 2:00 AM	12.4	524	9	515	0.7	17.
2:30 AM - 5:00 AM	11.0	506	11	495	0.8	16.
5:30 AM - 8:00 AM	10.8	536	16	520	0.6	21.

TABLE VII

TOWN OF SIMCOE

MUNICIPAL WATER POLLUTION CONTROL PLANT

SANITARY CHEMICAL ANALYSES RESULT-SAMPLES

COLLECTED DURING INSPECTIONS 1967 & 1968.

DATE AND SAMPLING LOCATION	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.		ANIONIC DETERGENTS AS ABS	PH	ALKALINITY AS CACO3	VOLATILE ACIDS AS ACETIC ACID
NOVEMBER 27, 1967									
RAW SEWAGE	410	980	300	680		2.3			
PRIMARY EFFLUENT OLD PLANT # 1	290	818	185	633		-			
PRIMARY EFFLUENT NEW PLANT # 2	320	900	264	636		-			
AERATION TANK MIXED LIQUOR - OLD PLANT #1		3196	2672	524	DRIED				
		876	486	390	ASHED				
		2320	2186	134	LOSS				
AERATION TANK MIXED LIQUOR - NEW PLANT # 2		2910	2354	556	DRIED				
		810	398	412	ASHED				
		2100	1956	144	LOSS				
RETURN SLUDGE OLD PLANT # 1		5388	4746	642					
RETURN SLUDGE NEW PLANT # 2		9748	8988	760					
PRIMARY DIGESTER # 1		19192	18092	1100	DRIED		7.7	2980	26
		6436	5696	740	ASHED				
		12756	12396	360	LOSS				
SECONDARY DIGESTER # 2		19794	18854	940	DRIED		7.1	3140	13
		7008	6358	650	ASHED				
		12786	12496	290	LOSS				
FINAL EFFLUENT OLD PLANT # 1	7.2	452	6	446		0.3			
FINAL EFFLUENT NEW PLANT # 2	6.8	456	8	448		0.6			
JANUARY 18, 1968									
RAW SLUDGE	-	26143	-	-	DRIED		5.7	848	1971
		7779	-	-	ASHED				
		18364	-	-	LOSS				
PRIMARY DIGESTOR	-	18488	17488	1000	DRIED		7.6	1434	1487
		7514	6950	564	ASHED				
		10974	10538	436	LOSS				
SECONDARY DIGESTOR	-	15814	14832	982	DRIED		7.2	2600	1088
		9674	8988	686	ASHED				
		6140	5844	296	LOSS				
SUPERNATANT FROM SIDE WALL	-	13582	12648	934	DRIED		7.2	3370	1730
		2735	2407	328	ASHED				
		10847	10241	606	LOSS				
FINAL EFFLUENT OLD PLANT # 1	6.1	470	6	464					
FINAL EFFLUENT NEW PLANT # 2	26.0	502	40	462					

TABLE VIII

TOWN OF SIMCOE

WATER POLLUTION SURVEY

1968

Location of Sampling Point and Date	5-Day BOD (ppm)	Filtered BOD	SOLIDS (ppm)			Anionic Detergents as ABS(ppm)	Coliform Count per 100 ml (M.F.)
			Total	Susp.	Diss.		
Union St.Storm Sewer							
Submerged outfall in Lynn R. June 20, 1968-3:20 p.m.	1140	860	1390	214	1176	0.0	99,000,000
Argyle St.Storm Sewer							
Outfall April 23, 1968	66	23	992	50	942 Dried	0.3	60,000
			880	4	876 Ashed		
			112	46	66 Loss		
June 10, 1968 10:00 a.m.	5.6		546	4	542	0.1	3,500
June 20, 1968 4:00 p.m.	13	6.5	478	15	463	0.0	5,300,000